

Jason George  
Gomez and Sullivan Engineers, PC  
55 North Stark Highway  
Weare, NH 03281

Subject: Laboratory Report


Eastern Analytical, Inc. ID: 44284  
Client Identification: Merrimack Village / 1210  
Date Received: 9/17/2004

Dear Mr. George :

Enclosed please find the reissued report for the above identified project. The hydrometer testing that was not included in the initial report is now included and any extraneous reports are excluded. This report package replaces the report package dated 10/7/2004.

Please feel free to contact me if you have additional questions or concerns regarding this matter. Thank you for this opportunity to be of service.

Sincerely,

  
Lorraine Olashaw, Lab Director

10/14/2004  
Date

28  
# of pages (excluding cover letter)



## SAMPLE CONDITIONS PAGE

**Eastern Analytical, Inc. ID#: 44284**

Client: **Gomez and Sullivan Engineers, PC**

Client Designation: **Merrimack Village / 1210**

Temperature upon receipt (°C): **12.8**

Received on ice or cold packs (Yes/No): **Y**

Lab ID	SampleID	Date Received	Date Sampled	Sample Matrix	% Dry Weight	Exceptions/Comments (other than thermal preservation)
44284.01	MVD-06	9/17/04	9/17/04	soil	78.0	Adheres to Sample Acceptance Policy
44284.02	Trip Blank	9/17/04	9/17/04	soil	100.0	Adheres to Sample Acceptance Policy

*Samples were properly preserved and the pH measured when applicable unless otherwise noted. Analysis of solids for pH, Flashpoint, Ignitibility, Paint Filter, Corrosivity, Conductivity and Specific Gravity are reported on an "as received" basis.*



# LABORATORY REPORT

**Eastern Analytical, Inc. ID#: 44284**

**Client: Gomez and Sullivan Engineers, PC Client Designation: Merrimack Village / 1210**

<b>Sample ID:</b>	MVD-06	Trip Blank
<b>Lab Sample ID:</b>	44284.01	44284.02
<b>Matrix:</b>	soil	soil
<b>Date Sampled:</b>	9/17/04	9/17/04
<b>Date Received:</b>	9/17/04	9/17/04
<b>Units:</b>	ug/kg	ug/kg
<b>Date of Analysis:</b>	9/21/04	9/21/04
<b>Analyst:</b>	JDS	JDS
<b>Method:</b>	8260B	8260B
<b>Dilution Factor:</b>	1	1
Dichlorodifluoromethane	< 200	< 200
Chloromethane	< 200	< 200
Vinyl chloride	< 100	< 100
Bromomethane	< 200	< 200
Chloroethane	< 200	< 200
Trichlorofluoromethane	< 200	< 200
Diethyl Ether	< 50	< 50
Acetone	< 2000	< 2000
1,1-Dichloroethene	< 50	< 50
tert-Butyl Alcohol (TBA)	< 2000	< 2000
Methylene chloride	< 100	< 100
Carbon disulfide	< 100	< 100
Methyl-t-butyl ether(MTBE)	< 100	< 100
Ethyl-t-butyl ether(ETBE)	< 200	< 200
Isopropyl ether(DIPE)	< 200	< 200
tert-amyl methyl ether(TAME)	< 200	< 200
trans-1,2-Dichloroethene	< 50	< 50
1,1-Dichloroethane	< 50	< 50
2,2-Dichloropropane	< 50	< 50
cis-1,2-Dichloroethene	< 50	< 50
2-Butanone(MEK)	< 500	< 500
Bromochloromethane	< 50	< 50
Tetrahydrofuran(THF)	< 500	< 500
Chloroform	< 50	< 50
1,1,1-Trichloroethane	< 50	< 50
Carbon tetrachloride	< 50	< 50
1,1-Dichloropropene	< 50	< 50
Benzene	< 50	< 50
1,2-Dichloroethane	< 50	< 50
Trichloroethene	< 50	< 50
1,2-Dichloropropane	< 50	< 50
Dibromomethane	< 50	< 50
Bromodichloromethane	< 50	< 50
4-Methyl-2-pentanone(MIBK)	< 500	< 500
cis-1,3-Dichloropropene	< 50	< 50
Toluene	< 50	< 50
trans-1,3-Dichloropropene	< 50	< 50
1,1,2-Trichloroethane	< 50	< 50
2-Hexanone	< 500	< 500
Tetrachloroethene	< 50	< 50
1,3-Dichloropropane	< 50	< 50
Dibromochloromethane	< 50	< 50
1,2-Dibromoethane	< 50	< 50
Chlorobenzene	< 50	< 50
1,1,1,2-Tetrachloroethane	< 50	< 50
Ethylbenzene	< 50	< 50

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Phone: (603) 228-0525



# LABORATORY REPORT

**Eastern Analytical, Inc. ID#: 44284**

**Client: Gomez and Sullivan Engineers, PC**    **Client Designation: Merrimack Village / 1210**

<b>Sample ID:</b>	MVD-06	Trip Blank
<b>Lab Sample ID:</b>	44284.01	44284.02
<b>Matrix:</b>	soil	soil
<b>Date Sampled:</b>	9/17/04	9/17/04
<b>Date Received:</b>	9/17/04	9/17/04
<b>Units:</b>	ug/kg	ug/kg
<b>Date of Analysis:</b>	9/21/04	9/21/04
<b>Analyst:</b>	JDS	JDS
<b>Method:</b>	8260B	8260B
<b>Dilution Factor:</b>	1	1
mp-Xylene	< 50	< 50
o-Xylene	< 50	< 50
Styrene	< 50	< 50
Bromoform	< 50	< 50
IsoPropylbenzene	< 50	< 50
Bromobenzene	< 50	< 50
1,1,2,2-Tetrachloroethane	< 50	< 50
1,2,3-Trichloropropane	< 50	< 50
n-Propylbenzene	< 50	< 50
2-Chlorotoluene	< 50	< 50
4-Chlorotoluene	< 50	< 50
1,3,5-Trimethylbenzene	< 50	< 50
tert-Butylbenzene	< 50	< 50
1,2,4-Trimethylbenzene	< 50	< 50
sec-Butylbenzene	< 50	< 50
1,3-Dichlorobenzene	< 50	< 50
p-Isopropyltoluene	< 50	< 50
1,4-Dichlorobenzene	< 50	< 50
1,2-Dichlorobenzene	< 50	< 50
n-Butylbenzene	< 50	< 50
1,2-Dibromo-3-chloropropane	< 50	< 50
1,2,4-Trichlorobenzene	< 50	< 50
Hexachlorobutadiene	< 50	< 50
Naphthalene	< 300	< 300
1,2,3-Trichlorobenzene	< 50	< 50
4-Bromofluorobenzene (surr)	99 %R	99 %R
1,2-Dichlorobenzene-d4 (surr)	100 %R	98 %R



# LABORATORY REPORT

Eastern Analytical, Inc. ID#:44284

Batch ID:

Client: Gomez and Sullivan Engineers,

Client Designation: Merrimack Village / 1210

## QC Report

Parameter Name	Blank	LCS	LCS Dup	Date of Analysis	
				Units	Method
Dichlorodifluoromethane	< 200			ug/kg	9/21/04 8260B
Chloromethane	< 200			ug/kg	9/21/04 8260B
Vinyl chloride	< 100			ug/kg	9/21/04 8260B
Bromomethane	< 200			ug/kg	9/21/04 8260B
Chloroethane	< 200			ug/kg	9/21/04 8260B
Trichlorofluoromethane	< 200			ug/kg	9/21/04 8260B
Diethyl Ether	< 50			ug/kg	9/21/04 8260B
Acetone	< 2000			ug/kg	9/21/04 8260B
1,1-Dichloroethene	< 50	920 (92 %R)	990 (99 %R) (7 RPD)	ug/kg	9/21/04 8260B
tert-Butyl Alcohol (TBA)	< 2000			ug/kg	9/21/04 8260B
Methylene chloride	< 100			ug/kg	9/21/04 8260B
Carbon disulfide	< 100			ug/kg	9/21/04 8260B
Methyl-t-butyl ether(MTBE)	< 100			ug/kg	9/21/04 8260B
Ethyl-t-butyl ether(ETBE)	< 200			ug/kg	9/21/04 8260B
Isopropyl ether(DIPE)	< 200			ug/kg	9/21/04 8260B
tert-amyl methyl ether(TAME)	< 200			ug/kg	9/21/04 8260B
trans-1,2-Dichloroethene	< 50			ug/kg	9/21/04 8260B
1,1-Dichloroethane	< 50			ug/kg	9/21/04 8260B
2,2-Dichloropropane	< 50			ug/kg	9/21/04 8260B
cis-1,2-Dichloroethene	< 50			ug/kg	9/21/04 8260B
2-Butanone(MEK)	< 500			ug/kg	9/21/04 8260B
Bromochloromethane	< 50			ug/kg	9/21/04 8260B
Tetrahydrofuran(THF)	< 500			ug/kg	9/21/04 8260B
Chloroform	< 50			ug/kg	9/21/04 8260B
1,1,1-Trichloroethane	< 50			ug/kg	9/21/04 8260B
Carbon tetrachloride	< 50			ug/kg	9/21/04 8260B
1,1-Dichloropropene	< 50			ug/kg	9/21/04 8260B
Benzene	< 50	1000 (102 %R)	1100 (106 %R) (4 RPD)	ug/kg	9/21/04 8260B
1,2-Dichloroethane	< 50			ug/kg	9/21/04 8260B
Trichloroethene	< 50	980 (98 %R)	1000 (102 %R) (4 RPD)	ug/kg	9/21/04 8260B
1,2-Dichloropropane	< 50			ug/kg	9/21/04 8260B
Dibromomethane	< 50			ug/kg	9/21/04 8260B
Bromodichloromethane	< 50			ug/kg	9/21/04 8260B
4-Methyl-2-pentanone(MIBK)	< 500			ug/kg	9/21/04 8260B
cis-1,3-Dichloropropene	< 50			ug/kg	9/21/04 8260B
Toluene	< 50	1000 (105 %R)	1100 (110 %R) (5 RPD)	ug/kg	9/21/04 8260B
trans-1,3-Dichloropropene	< 50			ug/kg	9/21/04 8260B
1,1,2-Trichloroethane	< 50			ug/kg	9/21/04 8260B
2-Hexanone	< 500			ug/kg	9/21/04 8260B
Tetrachloroethene	< 50			ug/kg	9/21/04 8260B
1,3-Dichloropropane	< 50			ug/kg	9/21/04 8260B
Dibromochloromethane	< 50			ug/kg	9/21/04 8260B
1,2-Dibromoethane	< 50			ug/kg	9/21/04 8260B
Chlorobenzene	< 50	1100 (111 %R)	1200 (115 %R) (4 RPD)	ug/kg	9/21/04 8260B

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# LABORATORY REPORT

Eastern Analytical, Inc. ID#:44284

Batch ID:

Client: Gomez and Sullivan Engineers,

Client Designation: Merrimack Village / 1210

## QC Report

Parameter Name	Blank	LCS	LCS Dup	Date of Analysis		
				Units		Method
1,1,1,2-Tetrachloroethane	< 50			ug/kg	9/21/04	8260B
Ethylbenzene	< 50			ug/kg	9/21/04	8260B
mp-Xylene	< 50			ug/kg	9/21/04	8260B
o-Xylene	< 50			ug/kg	9/21/04	8260B
Styrene	< 50			ug/kg	9/21/04	8260B
Bromoform	< 50			ug/kg	9/21/04	8260B
IsoPropylbenzene	< 50			ug/kg	9/21/04	8260B
Bromobenzene	< 50			ug/kg	9/21/04	8260B
1,1,2,2-Tetrachloroethane	< 50			ug/kg	9/21/04	8260B
1,2,3-Trichloropropane	< 50			ug/kg	9/21/04	8260B
n-Propylbenzene	< 50			ug/kg	9/21/04	8260B
2-Chlorotoluene	< 50			ug/kg	9/21/04	8260B
4-Chlorotoluene	< 50			ug/kg	9/21/04	8260B
1,3,5-Trimethylbenzene	< 50			ug/kg	9/21/04	8260B
tert-Butylbenzene	< 50			ug/kg	9/21/04	8260B
1,2,4-Trimethylbenzene	< 50			ug/kg	9/21/04	8260B
sec-Butylbenzene	< 50			ug/kg	9/21/04	8260B
1,3-Dichlorobenzene	< 50			ug/kg	9/21/04	8260B
p-Isopropyltoluene	< 50			ug/kg	9/21/04	8260B
1,4-Dichlorobenzene	< 50			ug/kg	9/21/04	8260B
1,2-Dichlorobenzene	< 50			ug/kg	9/21/04	8260B
n-Butylbenzene	< 50			ug/kg	9/21/04	8260B
1,2-Dibromo-3-chloropropane	< 50			ug/kg	9/21/04	8260B
1,2,4-Trichlorobenzene	< 50			ug/kg	9/21/04	8260B
Hexachlorobutadiene	< 50			ug/kg	9/21/04	8260B
Naphthalene	< 300			ug/kg	9/21/04	8260B
1,2,3-Trichlorobenzene	< 50			ug/kg	9/21/04	8260B
4-Bromofluorobenzene (surr)	98 %R	103 %R	96 %R	% Rec	9/21/04	8260B
1,2-Dichlorobenzene-d4 (surr)	96 %R	98 %R	99 %R	% Rec	9/21/04	8260B



# LABORATORY REPORT

**Eastern Analytical, Inc. ID#:44284**

**Batch ID:**

**Client: Gomez and Sullivan Engineers, PC**

**Client Designation: Merrimack Village / 1210**

## **Volatile Organic Compounds QC limits and Narrative Summary**

Matrix:	Solid	Aqueous
Units:	%	%
EPA Method	8260B	8260B
Surrogate Recovery		
4-Bromofluorobenzene	74-121	86-115
1,2-Dichlorobenzene-D4	80-120	80-120
Matrix Spike Recovery		
1,1-Dichloroethene	59-172	61-145
Trichloroethene	62-137	71-120
Benzene	66-142	76-127
Toluene	59-139	76-125
Chlorobenzene	60-133	75-130

Samples were extracted and analyzed within holding time limits.

Instrumentation was calibrated in accordance with the method requirements.

The method blanks were free of contamination at the reporting limits.

Sample surrogate recoveries met the above stated criteria.

The associated matrix spikes and/or Laboratory Control Samples met acceptance criteria.

There were no exceptions in the analyses, unless noted.



# LABORATORY REPORT

**Eastern Analytical, Inc. ID#: 44284**

**Client: Gomez and Sullivan Engineers, PC Client Designation: Merrimack Village / 1210**

**Sample ID:** MVD-06

**Lab Sample ID:** 44284.01

**Matrix:** soil

**Date Sampled:** 9/17/04

**Date Received:** 9/17/04

**Units:** ug/kg

**Date of Extraction/Preparation** 9/21/04

**Date of Analysis:** 9/28/04

**Analyst:** LLS

**Method:** 8270C

**Dilution Factor:** 1

Phenol	< 200
2-Chlorophenol	< 200
2,4-Dichlorophenol	< 200
2,4,5-Trichlorophenol	< 200
2,4,6-Trichlorophenol	< 200
Pentachlorophenol	< 1000
2-Nitrophenol	< 200
4-Nitrophenol	< 200
2,4-Dinitrophenol	< 1000
2-Methylphenol	< 200
3/4-Methylphenol	< 200
2,4-Dimethylphenol	< 200
4-Chloro-3-methylphenol	< 200
4,6-Dinitro-2-methylphenol	< 1000
Benzoic Acid	< 1000
N-Nitrosodimethylamine	< 200
n-Nitroso-di-n-propylamine	< 200
n-Nitrosodiphenylamine	< 200
bis(2-Chloroethyl)ether	< 200
bis(2-chloroisopropyl)ether	< 200
bis(2-Chloroethoxy)methane	< 200
1,3-Dichlorobenzene	< 200
1,4-Dichlorobenzene	< 200
1,2-Dichlorobenzene	< 200
1,2,4-Trichlorobenzene	< 200
2-Chloronaphthalene	< 200
4-Chlorophenyl-phenylether	< 200
4-Bromophenyl-phenylether	< 200
Hexachloroethane	< 200
Hexachlorobutadiene	< 200
Hexachlorocyclopentadiene	< 1000
Hexachlorobenzene	< 200
4-Chloroaniline	< 200
2-Nitroaniline	< 200
3-Nitroaniline	< 200
4-Nitroaniline	< 200
Benzyl alcohol	< 200
Nitrobenzene	< 200
Isophorone	< 200
2,4-Dinitrotoluene	< 200
2,6-Dinitrotoluene	< 200
Benzidine	< 400
3,3'-Dichlorobenzidine	< 200
Pyridine	< 200
Azobenzene	< 200



# LABORATORY REPORT

**Eastern Analytical, Inc. ID#: 44284**

**Client: Gomez and Sullivan Engineers, PC Client Designation: Merrimack Village / 1210**

**Sample ID:** MVD-06

**Lab Sample ID:** 44284.01  
**Matrix:** soil  
**Date Sampled:** 9/17/04  
**Date Received:** 9/17/04  
**Units:** ug/kg  
**Date of Extraction/Preparation** 9/21/04  
**Date of Analysis:** 9/28/04  
**Analyst:** LLS  
**Method:** 8270C  
**Dilution Factor:** 1  
Carbazole < 200  
Dimethylphthalate < 200  
Diethylphthalate < 200  
Di-n-butylphthalate < 200  
Butylbenzylphthalate < 200  
bis(2-Ethylhexyl)phthalate < 200  
Di-n-octylphthalate < 200  
Dibenzofuran < 200  
Naphthalene < 40  
2-Methylnaphthalene < 40  
Acenaphthylene < 40  
Acenaphthene < 40  
Fluorene < 40  
Phenanthrene < 40  
Anthracene < 40  
Fluoranthene < 40  
Pyrene < 40  
Benzo[a]anthracene < 40  
Chrysene < 40  
Benzo[b]fluoranthene < 40  
Benzo[k]fluoranthene < 40  
Benzo[a]pyrene < 40  
Indeno[1,2,3-cd]pyrene < 40  
Dibenz[a,h]anthracene < 40  
Benzo[g,h,i]perylene < 40  
2-Fluorophenol (surr) **49 %R**  
Phenol-D5 (surr) **56 %R**  
2,4,6-Tribromophenol (surr) **76 %R**  
Nitrobenzene-D5 (surr) **50 %R**  
2-Fluorobiphenyl (surr) **57 %R**  
p-Terphenyl-D14 (surr) **77 %R**



# LABORATORY REPORT

Eastern Analytical, Inc. ID#: 44284

Batch ID: S092104ABN1

Client: Gomez and Sullivan Engineers,

Client Designation: Merrimack Village / 1210

## QC Report

Parameter Name	Blank	LCS	LCS Dup	Units	Date of Analysis	
						Method
Phenol	< 200	6800 (82 %R)	7100 (86 %R) (5 RPD)	ug/kg	9/22/04	8270C
2-Chlorophenol	< 200	6600 (80 %R)	6900 (84 %R) (5 RPD)	ug/kg	9/22/04	8270C
2,4-Dichlorophenol	< 200			ug/kg	9/22/04	8270C
2,4,5-Trichlorophenol	< 200			ug/kg	9/22/04	8270C
2,4,6-Trichlorophenol	< 200			ug/kg	9/22/04	8270C
Pentachlorophenol	< 1000	7000 (90 %R)	8000 (103 %R) (13 RPD)	ug/kg	9/22/04	8270C
2-Nitrophenol	< 200			ug/kg	9/22/04	8270C
4-Nitrophenol	< 200	7600 (92 %R)	8600 (104 %R) (12 RPD)	ug/kg	9/22/04	8270C
2,4-Dinitrophenol	< 1000			ug/kg	9/22/04	8270C
2-Methylphenol	< 200			ug/kg	9/22/04	8270C
3/4-Methylphenol	< 200			ug/kg	9/22/04	8270C
2,4-Dimethylphenol	< 200			ug/kg	9/22/04	8270C
4-Chloro-3-methylphenol	< 200	7400 (90 %R)	7700 (94 %R) (4 RPD)	ug/kg	9/22/04	8270C
4,6-Dinitro-2-methylphenol	< 1000			ug/kg	9/22/04	8270C
Benzoic Acid	< 1000			ug/kg	9/22/04	8270C
N-Nitrosodimethylamine	< 200			ug/kg	9/22/04	8270C
n-Nitroso-di-n-propylamine	< 200	3900 (95 %R)	4200 (102 %R) (7 RPD)	ug/kg	9/22/04	8270C
n-Nitrosodiphenylamine	< 200			ug/kg	9/22/04	8270C
bis(2-Chloroethyl)ether	< 200			ug/kg	9/22/04	8270C
bis(2-chloroisopropyl)ether	< 200			ug/kg	9/22/04	8270C
bis(2-Chloroethoxy)methane	< 200			ug/kg	9/22/04	8270C
1,3-Dichlorobenzene	< 200			ug/kg	9/22/04	8270C
1,4-Dichlorobenzene	< 200	3500 (86 %R)	3700 (90 %R) (5 RPD)	ug/kg	9/22/04	8270C
1,2-Dichlorobenzene	< 200			ug/kg	9/22/04	8270C
1,2,4-Trichlorobenzene	< 200	3700 (90 %R)	3800 (91 %R) (1 RPD)	ug/kg	9/22/04	8270C
2-Chloronaphthalene	< 200			ug/kg	9/22/04	8270C
4-Chlorophenyl-phenylether	< 200			ug/kg	9/22/04	8270C
4-Bromophenyl-phenylether	< 200			ug/kg	9/22/04	8270C
Hexachloroethane	< 200			ug/kg	9/22/04	8270C
Hexachlorobutadiene	< 200			ug/kg	9/22/04	8270C
Hexachlorocyclopentadiene	< 1000			ug/kg	9/22/04	8270C
Hexachlorobenzene	< 200			ug/kg	9/22/04	8270C
4-Chloroaniline	< 200			ug/kg	9/22/04	8270C
2-Nitroaniline	< 200			ug/kg	9/22/04	8270C
3-Nitroaniline	< 200			ug/kg	9/22/04	8270C
4-Nitroaniline	< 200			ug/kg	9/22/04	8270C
Benzyl alcohol	< 200			ug/kg	9/22/04	8270C
Nitrobenzene	< 200			ug/kg	9/22/04	8270C
Isophorone	< 200			ug/kg	9/22/04	8270C
2,4-Dinitrotoluene	< 200	4000 (97 %R)	4400 (106 %R) (9 RPD)	ug/kg	9/22/04	8270C
2,6-Dinitrotoluene	< 200			ug/kg	9/22/04	8270C
Benzidine	< 400			ug/kg	9/22/04	8270C
3,3'-Dichlorobenzidine	< 200			ug/kg	9/22/04	8270C
Pyridine	< 200			ug/kg	9/22/04	8270C
Azobenzene	< 200			ug/kg	9/22/04	8270C

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# LABORATORY REPORT

Eastern Analytical, Inc. ID#: 44284

Batch ID: S092104ABN1

Client: Gomez and Sullivan Engineers,

Client Designation: Merrimack Village / 1210

## QC Report

Parameter Name	Blank	LCS	LCS Dup	Date of Analysis		Method
				Units		
Carbazole	< 200			ug/kg	9/22/04	8270C
Dimethylphthalate	< 200			ug/kg	9/22/04	8270C
Diethylphthalate	< 200			ug/kg	9/22/04	8270C
Di-n-butylphthalate	< 200			ug/kg	9/22/04	8270C
Butylbenzylphthalate	< 200			ug/kg	9/22/04	8270C
bis(2-Ethylhexyl)phthalate	< 200			ug/kg	9/22/04	8270C
Di-n-octylphthalate	< 200			ug/kg	9/22/04	8270C
Dibenzofuran	< 200			ug/kg	9/22/04	8270C
Naphthalene	< 40			ug/kg	9/22/04	8270C
2-Methylnaphthalene	< 40			ug/kg	9/22/04	8270C
Acenaphthylene	< 40			ug/kg	9/22/04	8270C
Acenaphthene	< 40	3800 (93 %R)	4000 (96 %R) (3 RPD)	ug/kg	9/22/04	8270C
Fluorene	< 40			ug/kg	9/22/04	8270C
Phenanthrene	< 40			ug/kg	9/22/04	8270C
Anthracene	< 40			ug/kg	9/22/04	8270C
Fluoranthene	< 40			ug/kg	9/22/04	8270C
Pyrene	< 40	4000 (98 %R)	4200 (102 %R) (4 RPD)	ug/kg	9/22/04	8270C
Benzo[a]anthracene	< 40			ug/kg	9/22/04	8270C
Chrysene	< 40			ug/kg	9/22/04	8270C
Benzo[b]fluoranthene	< 40			ug/kg	9/22/04	8270C
Benzo[k]fluoranthene	< 40			ug/kg	9/22/04	8270C
Benzo[a]pyrene	< 40			ug/kg	9/22/04	8270C
Indeno[1,2,3-cd]pyrene	< 40			ug/kg	9/22/04	8270C
Dibenz[a,h]anthracene	< 40			ug/kg	9/22/04	8270C
Benzo[g,h,i]perylene	< 40			ug/kg	9/22/04	8270C
2-Fluorophenol (surr)	74 %R	80 %R	81 %R	% Rec	9/22/04	8270C
Phenol-D5 (surr)	78 %R	84 %R	87 %R	% Rec	9/22/04	8270C
2,4,6-Tribromophenol (surr)	89 %R	101 %R	106 %R	% Rec	9/22/04	8270C
Nitrobenzene-D5 (surr)	76 %R	81 %R	81 %R	% Rec	9/22/04	8270C
2-Fluorobiphenyl (surr)	85 %R	92 %R	96 %R	% Rec	9/22/04	8270C
p-Terphenyl-D14 (surr)	92 %R	99 %R	101 %R	% Rec	9/22/04	8270C



# LABORATORY REPORT

Eastern Analytical, Inc. ID#: 44284

Batch ID:

Client: Gomez and Sullivan Engineers, PC

Client Designation: Merrimack Village / 1210

## Acid and Base/Neutral Extractable Compounds QA/QC and Narrative Report

Matrix:	Aqueous		Solid	
Units:	%		%	
EPA Method:	625/8270	RPD	8270	RPD

### Acid Extractables Spikes:

Phenol	12-110	42	26-90	35
2-Chlorophenol	27-123	40	25-102	50
4-Chloro-3-methylphenol	23-97	42	26-103	33
4-Nitrophenol	10-80	50	11-114	50
Pentachlorophenol	9-103	50	17-109	47

### Base/Neutral Extractables Spikes:

N-Nitroso-di-n-propylamine	41-116	38	41-126	38
1,4-Dichlorobenzene	36-97	28	28-104	27
1,2,4-Trichlorobenzene	39-98	28	38-107	23
2,4-Dinitrotoluene	24-96	38	28-89	47
Acenaphthene	46-118	31	31-137	19
Pyrene	26-127	31	35-142	36

### Acid Extractables Surrogates:

2-Fluorophenol	21-110	25-121
Phenol-d5	10-94	24-113
2,4,6-Tribromophenol	10-123	19-122

### Base/Neutral Extractables Surrogates:

Nitrobenzene-d5	35-114	23-120
2-Fluorobiphenyl	43-116	30-115
p-Terphenyl-d14	33-141	18-137

Samples were extracted and analyzed within holding time limits.

Instrumentation was tuned and calibrated in accordance with the method requirements.

The associated method blank(s) were free of contamination at the reporting limit.

The associated (MS) matrix spike(s) and/or (LCS) Laboratory Control Sample(s) met the above stated criteria.

There were no exceptions in the analyses, unless noted.

DOR: Diluted out of calibration range.

MI: Matrix interference.

2,4-Dinitrotoluene recovery for the LCS/LCSD is above the limit. NELAC regulations permit this exception in situations where there are no measurable concentrations in the samples for the analyte exceeding the limit. The data for the associated sample analyses need not be qualified.



# LABORATORY REPORT

Eastern Analytical, Inc. ID#: 44284

Client: Gomez and Sullivan Engineers, PC

Client Designation: Merrimack Village / 1210

Sample ID: MVD-06

Lab Sample ID: 44284.01

Matrix: soil

Date Sampled: 9/17/04

Date Received: 9/17/04

Units: ug/kg

Date of Extraction/Prep: 9/17/04

Date of Analysis: 9/18/04

Analyst: MDM

Method: 8081A

Dilution Factor: 1

Aldrin	< 10
alpha-BHC	< 10
beta-BHC	< 10
Lindane (gamma-BHC)	< 10
delta-BHC	< 10
Chlordane	< 100
4,4'-DDT	< 10
4,4'-DDE	< 10
4,4'-DDD	< 10
Dieldrin	< 10
Endosulfan I	< 10
Endosulfan II	< 10
Endosulfan Sulfate	< 10
Endrin	< 10
Endrin Aldehyde	< 10
Heptachlor	< 10
Heptachlor Epoxide	< 10
Methoxychlor	< 10
Toxaphene	< 100
TMX (surr)	80 %R
DCB (surr)	79 %R



# LABORATORY REPORT

**Eastern Analytical, Inc. ID#: 44284**

**Client: Gomez and Sullivan Engineers, PC**

**Client Designation: Merrimack Village / 1210**

**Sample ID: MVD-06**

**Lab Sample ID: 44284.01**

**Matrix: soil**

**Date Sampled: 9/17/04**

**Date Received: 9/17/04**

**Units: ug/kg**

**Date of Extraction/Prep: 9/17/04**

**Date of Analysis: 9/18/04**

**Analyst: MDM**

**Method: 8082**

**Dilution Factor: 1**

PCB-1016 < 100

PCB-1221 < 100

PCB-1232 < 100

PCB-1242 < 100

PCB-1248 < 100

PCB-1254 < 100

PCB-1260 < 100

TMX (surr) **109 %R**

DCB (surr) **93 %R**



# LABORATORY REPORT

Eastern Analytical, Inc. ID#: 44284

Batch ID: S091704Pest1

Client: Gomez and Sullivan Engineers, PC

Client Designation: Merrimack Village / 1210

## QC Report

Parameter Name	Blank	LCS	LCS Dup	Units	Date of Analysis	Method
Aldrin	< 10	30 (83 %R)	30 (86 %R) (4 RPD)	ug/kg	9/18/04	8081A
alpha-BHC	< 10	30 (85 %R)	30 (87 %R) (2 RPD)	ug/kg	9/18/04	8081A
beta-BHC	< 10	30 (90 %R)	30 (91 %R) (1 RPD)	ug/kg	9/18/04	8081A
Lindane (gamma-BHC)	< 10	30 (87 %R)	30 (88 %R) (1 RPD)	ug/kg	9/18/04	8081A
delta-BHC	< 10	30 (88 %R)	30 (89 %R) (1 RPD)	ug/kg	9/18/04	8081A
Chlordane	< 100	< 100 (88 %R)	< 100 (90 %R) (2 RPD)	ug/kg	9/18/04	8081A
4,4'-DDT	< 10	30 (89 %R)	30 (90 %R) (1 RPD)	ug/kg	9/18/04	8081A
4,4'-DDE	< 10	30 (88 %R)	30 (90 %R) (2 RPD)	ug/kg	9/18/04	8081A
4,4'-DDD	< 10	30 (89 %R)	30 (91 %R) (2 RPD)	ug/kg	9/18/04	8081A
Dieldrin	< 10	30 (88 %R)	30 (90 %R) (2 RPD)	ug/kg	9/18/04	8081A
Endosulfan I	< 10	30 (87 %R)	30 (89 %R) (2 RPD)	ug/kg	9/18/04	8081A
Endosulfan II	< 10	30 (87 %R)	30 (89 %R) (2 RPD)	ug/kg	9/18/04	8081A
Endosulfan Sulfate	< 10	30 (88 %R)	30 (90 %R) (2 RPD)	ug/kg	9/18/04	8081A
Endrin	< 10	30 (101 %R)	30 (104 %R) (3 RPD)	ug/kg	9/18/04	8081A
Endrin Aldehyde	< 10	30 (82 %R)	30 (86 %R) (5 RPD)	ug/kg	9/18/04	8081A
Heptachlor	< 10	30 (89 %R)	30 (91 %R) (2 RPD)	ug/kg	9/18/04	8081A
Heptachlor Epoxide	< 10	30 (87 %R)	30 (89 %R) (2 RPD)	ug/kg	9/18/04	8081A
Methoxychlor	< 10	30 (94 %R)	30 (97 %R) (3 RPD)	ug/kg	9/18/04	8081A
Toxaphene	< 100	< 100 (%R N/A)	< 100 (%R N/A) (RPD N/A)	ug/kg	9/18/04	8081A
TMX (surr)	89 %R	92 %R	90 %R	% Rec	9/18/04	8081A
DCB (surr)	91 %R	98 %R	96 %R	% Rec	9/18/04	8081A



# LABORATORY REPORT

Eastern Analytical, Inc. ID#: 44284

Batch ID: S091604PCB1

Client: Gomez and Sullivan Engineers, PC

Client Designation: Merrimack Village / 1210

## QC Report

Parameter Name	Blank	LCS	LCS Dup	Units	Date of Analysis	Method
PCB-1016	< 100	< 100 (91 %R)	< 100 (100 %R) (9 RPD)	ug/kg	9/17/04	8082
PCB-1221	< 100	< 100 (%R N/A)	< 100 (%R N/A) (RPD N/A)	ug/kg	9/17/04	8082
PCB-1232	< 100	< 100 (%R N/A)	< 100 (%R N/A) (RPD N/A)	ug/kg	9/17/04	8082
PCB-1242	< 100	< 100 (%R N/A)	< 100 (%R N/A) (RPD N/A)	ug/kg	9/17/04	8082
PCB-1248	< 100	< 100 (%R N/A)	< 100 (%R N/A) (RPD N/A)	ug/kg	9/17/04	8082
PCB-1254	< 100	< 100 (%R N/A)	< 100 (%R N/A) (RPD N/A)	ug/kg	9/17/04	8082
PCB-1260	< 100	< 100 (101 %R)	< 100 (108 %R) (7 RPD)	ug/kg	9/17/04	8082
TMX (surr)	95 %R	103 %R	105 %R	% Rec	9/17/04	8082
DCB (surr)	101 %R	110 %R	106 %R	% Rec	9/17/04	8082



# LABORATORY REPORT

Eastern Analytical, Inc. ID#:44284

Batch ID: S091704Pest1

Client: Gomez and Sullivan Engineers, PC

Client Designation: Merrimack Village / 1210

## Pesticides QA/QC and Narrative Report

Matrix:	Aqueous	Solid
Units:	%	%
EPA Method:	8081A/8082	8081A/8082
Aldrin	30-150	30-150
alpha-BHC	30-150	30-150
beta-BHC	30-150	30-150
gamma-BHC	30-150	30-150
delta-BHC	30-150	30-150
Chlordane	30-150	30-150
4,4'-DDT	30-150	30-150
4,4'-DDE	30-150	30-150
4,4'-DDD	30-150	30-150
Dieldrin	30-150	30-150
Endosulfan I	30-150	30-150
Endosulfan II	30-150	30-150
Endosulfan Sulfate	30-150	30-150
Endrin	30-150	30-150
Endrin Aldehyde	30-150	30-150
Endrin Ketone	30-150	30-150
Heptachlor	30-150	30-150
Heptachlor Epoxide	30-150	30-150
Methoxychlor	30-150	30-150
Aroclors 1242-1260	30-150	30-150
TMX(Surr)	30-150	30-150
DCB(Surr)	30-150	30-150

Samples were extracted and analyzed within holding time limits.

Instrumentation was tuned and calibrated in accordance with the method requirements.

The associated method blank(s) were free of contamination at the reporting limit.

All samples met the above stated criteria for surrogate recovery.

The associated Matrix Spike(s) and/or Laboratory Control Sample (LCS)(s) met the above stated criteria.

There were no exceptions in the analyses, unless noted below.



# LABORATORY REPORT

Eastern Analytical, Inc. ID#: **44284**

Client: **Gomez and Sullivan Engineers, PC**

Client Designation: **Merrimack Village / 1210**

Sample ID: MVD-06

Lab Sample ID: 44284.01

Matrix: soil

Date Sampled: 9/17/04

Date Received: 9/17/04

Arsenic	1.1
Barium	13
Cadmium	< 0.5
Chromium	2.9
Copper	1.3
Lead	3.0
Mercury	< 0.1
Nickel	2.0
Zinc	12

Units	Date of Analysis	Method	Analyst
mg/kg	9/27/04	6020	DS
mg/kg	9/27/04	6020	DS
mg/kg	9/27/04	6020	DS
mg/kg	9/27/04	6020	DS
mg/kg	9/27/04	6020	DS
mg/kg	9/27/04	6020	DS
mg/kg	9/27/04	6020	DS
mg/kg	9/27/04	6020	DS
mg/kg	9/27/04	6020	DS



# LABORATORY REPORT

Eastern Analytical, Inc. ID#: 44284

Client: Gomez and Sullivan Engineers,  
PC

Client Designation: Merrimack Village / 1210

## QC Report

Parameter Name	Blank	LCS	LCS Dup	Date of Analysis	
				Units	Method
Arsenic	< 0.5	40 (100 %R)		mg/kg	9/27/04 6020
Barium	< 0.5	39 (98 %R)		mg/kg	9/27/04 6020
Cadmium	< 0.5	40 (100 %R)		mg/kg	9/27/04 6020
Chromium	< 0.5	38 (94 %R)		mg/kg	9/27/04 6020
Copper	< 0.5	39 (97 %R)		mg/kg	9/27/04 6020
Lead	< 0.5	39 (98 %R)		mg/kg	9/27/04 6020
Mercury	< 0.1	0.4 (98 %R)		mg/kg	9/27/04 6020
Nickel	< 0.5	39 (97 %R)		mg/kg	9/27/04 6020
Zinc	< 0.5	35 (87 %R)		mg/kg	9/27/04 6020

Parameter Name	MS/MSD Parent ID	MS/MSD Parent	Matrix Spike	Matrix Spike Duplicate
Arsenic	44282.1	1.2	1000 (101 %R)	1000 (101 %R) (0 RPD)
Barium	44282.1	11	1000 (103 %R)	1000 (102 %R) (1 RPD)
Cadmium	44282.1	< 0.5	1000 (105 %R)	1000 (104 %R) (1 RPD)
Chromium	44282.1	3.5	920 (92 %R)	930 (93 %R) (1 RPD)
Copper	44282.1	3.0	910 (91 %R)	930 (92 %R) (1 RPD)
Lead	44282.1	3.3	1000 (104 %R)	1000 (103 %R) (1 RPD)
Mercury	44282.1	< 0.1	1.1 (109 %R)	1.1 (108 %R) (1 RPD)
Nickel	44282.1	2.0	910 (90 %R)	910 (90 %R) (0 RPD)
Zinc	44282.1	9.3	830 (82 %R)	840 (83 %R) (1 RPD)



# LABORATORY REPORT

Eastern Analytical, Inc. ID#:44284

Batch ID:

Client: Gomez and Sullivan Engineers, PC

Client Designation: Merrimack Village / 1210

## Metals QA/QC and Narrative Report

QA/QC:	LCS	MS	MSD
Matrix:	Aqueous/Soil	Aqueous/Soil	Aqueous/Soil
Units:	%	%	%
EPA Method:	6010B/6020	6010B/6020	6010B/6020
Aluminum	85-115	75-125	75-125
Antimony	85-115	75-125	75-125
Arsenic	85-115	75-125	75-125
Barium	85-115	75-125	75-125
Beryllium	85-115	75-125	75-125
Boron	85-115	75-125	75-125
Cadmium	85-115	75-125	75-125
Calcium	85-115	75-125	75-125
Chromium	85-115	75-125	75-125
Chromium III	85-115	75-125	75-125
Chromium IV	85-115	75-125	75-125
Cobalt	85-115	75-125	75-125
Copper	85-115	75-125	75-125
Iron	85-115	75-125	75-125
Lead	85-115	75-125	75-125
Magnesium	85-115	75-125	75-125
Manganese	85-115	75-125	75-125
Mercury	85-115	75-125	75-125
Molybdenum	85-115	75-125	75-125
Nickel	85-115	75-125	75-125
Phosphorus	85-115	75-125	75-125
Potassium	85-115	75-125	75-125
Selenium	85-115	75-125	75-125
Silicon	85-115	75-125	75-125
Silver	85-115	75-125	75-125
Sodium	85-115	75-125	75-125
Thallium	85-115	75-125	75-125
Tin	85-115	75-125	75-125
Titanium	85-115	75-125	75-125
Vanadium	85-115	75-125	75-125
Zinc	85-115	75-125	75-125

Samples were analyzed within holding time limits.

Instrumentation was calibrated in accordance with the method requirements.

The method blanks were free of contamination at the reporting limits.

The associated matrix spikes and/or Laboratory Control Samples met the above stated criteria.

There were no exceptions in the analyses, unless noted below.



# MILLER ENGINEERING & TESTING INC.

## TRANSMITTAL LETTER

TO: MICHAEL SERARD  
EASTERN ANALYTICAL INC.  
25 CHENELL DRIVE  
CONCORD, NH 03301

DATE: 10/11/04  
JOB NO: 01.428.NH  
PROJECT: EASTERN ANALYTICAL-  
Q.C.  
LOCATION:

Enclosed we are sending the following reports:

COPIES:	DATE:	DESCRIPTION:
1	10/08/04	GRAIN SIZE DISTRIBUTION – AGGREGATE GRADING (L040913A&B)

Remarks:


COPIES TO:


Thank You,

MILLER ENGINEERING & TESTING INC.

Peter Schwotzer

**CORPORATE OFFICE:** 100 Sheffield Road - PO BOX 4776 - Manchester, NH 03108 - TEL: (603) 668-6016 - FAX: (603) 668-8641  
**SATELLITE OFFICES:** 130 East Main St. - P.O. BOX 11 - Northborough, MA 01532 - TEL: (508) 393-2607 - FAX: (508) 393-8490  
474 Dorchester Ave. - Boston, MA 02127 - TEL: (617) 269-8829 - FAX: (617) 269-8837

# GRAIN SIZE DISTRIBUTION - AGGREGATE GRADING



MILLER ENGINEERING & TESTING, INC.

Boring No.: N/A

Sample No.: L040913B

Tested by : DM/BM

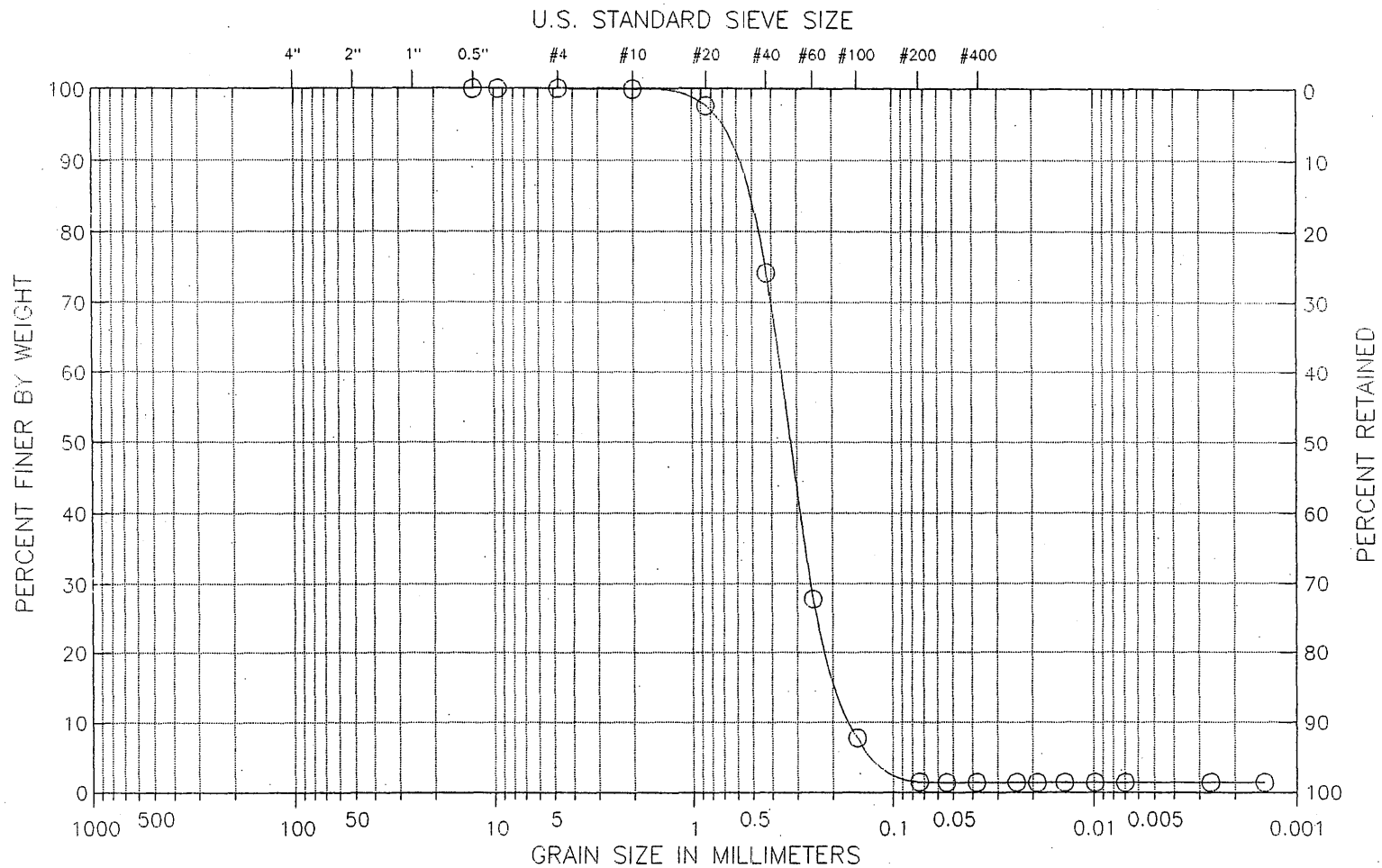
Filename : L040913B

Project : EASTERN ANALYTICAL

Project No.: 01.428.NH

Location: MVD-06

Date : Fri Oct 08 2004



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

Classification :  
(SP) Poorly graded sand  
Visual Description :  
BORING JAR SAMPLE

Remarks :  
ASAP

## GEOTECHNICAL LABORATORY TEST DATA

Project : EASTERN ANALYTICAL  
 Project No. : 01.428.NH  
 Boring No. : N/A  
 Sample No. : L040913B  
 Location : MVD-06  
 Soil Description : BORING JAR SAMPLE  
 Remarks : ASAP

Depth : N/A  
 Test Date : 10-4-04  
 Test Method : ASTM

Filename : L040913B  
 Elevation : N/A  
 Tested by : DM/BM  
 Checked by : BC

## COARSE SIEVE SET

Sieve	Sieve Openings		Weight	Cumulative	Percent
Mesh	Inches	Millimeters	Retained	Weight Retained	Finer
			(gm)	(gm)	(%)
0.5"	0.500	12.70	0.00	0.00	100
0.375"	0.375	9.52	0.00	0.00	100
#4	0.187	4.75	0.00	0.00	100

Total Weight of Sample = 285.2

Tare Weight = 0

## FINE SIEVE SET

Sieve	Sieve Openings		Weight	Cumulative	Percent
Mesh	Inches	Millimeters	Retained	Weight Retained	Finer
			(gm)	(gm)	(%)
#10	0.079	2.00	0.10	0.10	100
#20	0.033	0.85	4.20	4.30	98
#40	0.017	0.43	42.70	47.00	74
#60	0.010	0.25	84.20	131.20	28
#100	0.006	0.15	36.50	167.70	8
#200	0.003	0.07	11.40	179.10	1
Pan			2.70	181.80	0

Total Weight of Sample = 181.8

Tare Weight = 0

Moisture Content = 0

D85 : 0.5854 mm

D60 : 0.3614 mm

D50 : 0.3223 mm

D30 : 0.2563 mm

D15 : 0.1804 mm

D10 : 0.1588 mm

## Soil Classification

ASTM Group Symbol : SP

ASTM Group Name : Poorly graded sand

AASHTO Group Symbol : A-3(0)

AASHTO Group Name : Fine Sand

## GEOTECHNICAL LABORATORY TEST DATA

Project : EASTERN ANALYTICAL  
 Project No. : 01.428.NH  
 Boring No. : N/A  
 Sample No. : L040913B  
 Location : MVD-06  
 Soil Description : BORING JAR SAMPLE  
 Remarks : ASAP

Depth : N/A  
 Test Date : 10-4-04  
 Test Method : ASTM

Filename : L040913B  
 Elevation : N/A  
 Tested by : DM/BM  
 Checked by : BC

## HYDROMETER

Hydrometer ID : YY  
 Weight of air-dried soil = 74.4 gm  
 Specific Gravity = 2.55

## Hygroscopic Moisture Content :

Weight of Wet Soil = 0 gm  
 Weight of Dry Soil = 0 gm  
 Moisture Content = 0

Elapsed Time (min)	Reading	Temperature (deg. C)	Corrected Reading	Particle Size (mm)	Percent Finer (%)	Adjusted Particle Size
1.00	7.00	21.00	1.00	0.054	1	0.054
2.00	7.00	21.00	1.00	0.038	1	0.038
5.00	7.00	21.00	1.00	0.024	1	0.024
8.00	7.00	21.00	1.00	0.019	1	0.019
15.00	7.00	21.00	1.00	0.014	1	0.014
30.00	7.00	21.00	1.00	0.010	1	0.010
60.00	7.00	21.00	1.00	0.007	1	0.007
420.00	7.00	21.00	1.00	0.003	1	0.003
1440.00	7.00	20.20	1.00	0.001	1	0.001

# CHAIN-OF-CUSTODY RECORD

Eastern Analytical  
professional laboratory services

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
MVD-06	9/17/2004 9:45	soil	Sieve aka Grain Size Subcontract	
MVD-06	9/17/2004 9:45	soil	Hydrometer Subcontract	B4Z

Project # **44284** Project State: NH

Results Needed by: Preferred date **9/30/2004**

Notes about project

Company Miller Engineering  
Address 100 Sheffield Road  
Address Manchester, NH 03101  
Account #  
Phone # 668-6016

Eastern Analytical Inc. PO Number

17741

Report To: Front Office

Invoice To: Accounts Payable

Samples Collected by:

Relinquished by Joe H... Date/Time 9.20.04 153 7:30 Received by Bob  
Relinquished by Bob Date/Time 9.20.04 1530 Received by Bob

Fax Number

Eastern Analytical, Inc. 25 Chenell Dr. Concord, NH 03301

Phone: (603)228-0525

1-800-287-0525

Fax: (603)228-4591

# NGS Analytical Laboratory

P.O. Box 2010

West Springfield, MA 01090-2010

Phone (413) 787-9064 Fax (413) 787-9056

Mass Certification - MA-00071

Conn Certification - PH-0520

Report Date October 1, 2004



**Northeast  
Generation Services**

The Northeast Utilities System

Customer	Contact	Laboratory Manager	eMail
Eastern Analytical	P. Gagnon	Madhu Shah	shahmp@nu.com
<b>Sample Description</b> Analysis of Soil Sample			

## Samples Analyzed

**Enclosed are Report No(s): 4932**

**Reported on dry basis.**

Vist our web site at [www.ngs-nu.com](http://www.ngs-nu.com)

**Thank you for your business**

Madhu Shah, NGS Laboratory Manager

Date

ALL the information contained in this report has been reviewed for accuracy and checked against all quality control requirements outlined in each applicable method. It meets the requirements of NELAC, including any data obtained from a subcontract laboratory. This report may not be reproduced, except in full, without written approval from NGS Analytical Laboratory.

# Sample Analysis

Work Order 04-1400

Sample Description	Source	Taken/Time	Received
4932 MVD-06	Eastern Analytical	9/17/04	9/21/04

Parameter	Results	MDL	Method	Analyzed/Time
Total Organic Carbon	1,110 mg/kg	100.00	SW 846 9060	09/30/04

# CHAIN-OF-CUSTODY RECORD

eastern analytical  
professional laboratory services

Sample ID	Date Sampled	Matrix	aParameters	Sample Notes
MVD-06	9/17/2004 9:45	soil	TOC Solid Subcontract	

Project # **44284** Project State: NH

Results Needed by: Preferred date **9/30/2004**

Notes about project

Company Northeast Generation  
Address 15 Agawam Ave  
Address West Springfield, MA 01089  
Account #  
Phone # (413) 787-9064

Eastern Analytical Inc. PO Number 17742

Report To: Front Office

Invoice To: Accounts Payable

Samples Collected by: Jul 4th 9-20-04 15:30

Relinquished by Date/Time Received by

Relinquished by Date/Time Received by

Fax Number (413) 787-9056  
Eastern Analytical, Inc. 25 Chenell Dr. Concord, NH 03301

Phone: (603)228-0525 1-800-287-0525 Fax: (603)228-4591

# CHAIN-OF-CUSTODY RECORD

eastern analytical  
professional laboratory services

44284

GSPCnn

EAI Project ID 932

Matrix
A - Air
S - Soil
GW - Ground W.
SW - Surface W.
DW - Drinking W.
WW - Waste W.
<input checked="" type="checkbox"/> Other

SampleID	Date/Time	Matrix	Parameters	Sample Notes	# of containers
Sediment MVD-06	9.17.04 9:45	Sediment	SolTotDry/Pest/PCB/ICPMets-As-Ba-Cd-Cu-Cr-Pb-Hg-Zn-Ni/VNH8260BFullList/ABN/SieveSub/TOC SolSub/HydrometerSub		<div style="border: 1px solid black; width: 30px; height: 30px; text-align: center; line-height: 30px;">5</div>
preservative: HCL HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaOH MEOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ICE					
Trip Blank			SolTotDry/VNH8260BFullList		<div style="border: 1px solid black; width: 30px; height: 30px;"></div>
preservative: HCL HNO <sub>3</sub> H <sub>2</sub> SO <sub>4</sub> NaOH MEOH Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> ICE					

Field Filtered Metals Check here ☐

Field Filtered Metals Check here ☐

Project Name Merrimack Village / 1210

EAI Batch # State NH

Client (Pro Mgr) Jason George

Customer Gomez and Sullivan Engineers, PC

Address 55 North Stark Highway

City Weare NH 03281

Phone 529-4400

Fax 529-4411

EmailAddress: jgeorge@gomezandsullivan.com

Results Needed by: Preferred date \_\_\_\_\_

Notes about project

QC deliverables ☐ A ☒ B ☐ C

ReportingOptions

PONumber: verbal


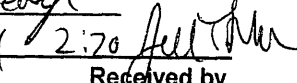
- ☒ HC ☒ EDD email  
☐ NO FAX  
☐ Partial Fax  
☐ EDD Disk

Quote No: 1002283

Temperature 12.8°C

Ice present Yes ☒ No ☐

Samples Collected by: Jason George

Relinquished by  Date/Time 9/17/04 2:20 Received by 

Relinquished by Date/Time Received by

**TOXICOLOGICAL EVALUATION  
OF SEDIMENT SAMPLES**

Merrimack Village

Prepared For

Gomez & Sullivan Engineers  
55 North Stark Highway  
Weare, New Hampshire 03281

By

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September 2004  
Reference Number 12564-04-09

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# TOXICOLOGICAL EVALUATION OF SEDIMENT SAMPLES

Merrimack Village

## 1.0 INTRODUCTION

Toxicity tests expose groups of organisms to environmental samples and a laboratory control and/or a field reference site for a specified period to assess potential impact on survival and growth. Analysis of variance techniques are used to determine the relative toxicity of the samples as compared to the laboratory control and/or field reference site.

This report presents the results of acute toxicity tests conducted on two sediment samples collected from the Merrimack Village site. Sediment samples were collected by Gomez and Sullivan Engineers staff. Testing was based on programs and protocols developed by the ASTM (2001) and US EPA (2000). The toxicity of the samples was assessed by conducting 10 day static renewal toxicity tests using the freshwater amphipod, *Hyaella azteca*. Testing was performed at EnviroSystems, Incorporated (ESI), Hampton, New Hampshire.

## 2.0 MATERIALS AND METHODS

### 2.1 General Methods, Biological Evaluations

Toxicological and analytical protocols used in this program follow procedures outlined in, *Test Methods for Measuring the Toxicity of Sediment-Associated Contaminants with Freshwater Invertebrates* (ASTM 2001), *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates* (US EPA 2000) and *Standard Methods for the Examination of Water and Wastewater*, 20<sup>th</sup> Edition (APHA 1998). These protocols provide standard approaches for physical and chemical analysis and for the evaluation of toxicological effects of sediments on aquatic invertebrates.

### 2.2 Test Species

*Hyaella azteca* were obtained from Aquatic Research Organisms, Hampton, New Hampshire. Organisms were seven days old at the beginning of the test. Amphipods were cultured at approximate test conditions.

### 2.3 Test Samples and Laboratory Control Sediment

A total of two sediment samples were received at ESI on September 17, 2004. Upon arrival at ESI, samples were given ESI sample identification numbers and refrigerated at 2-4° C until required for testing. Sample collection and receipt information are presented in Table 1.

The laboratory control substrate was an artificial sediment consisting primarily of silica sand, with less than 1% organic material by weight.

## 2.4 *Hyalella azteca* Survival and Growth Tests

The 10 day sediment tests were conducted according to the ASTM (2001) and US EPA (2000) protocols. Endpoints of the test were survival and growth (dry weight). The toxicity test was started on September 21, 2004 and successfully completed October 1, 2004.

The site specific sediment and laboratory control sediment tests consisted of 8 replicates with 10 organisms/replicate. Test vessels were 400 mL glass beakers containing approximately 100 mL of sediment and 250 mL of overlying water. As described by the protocol, test vessels were drilled at a consistent height above their bases to facilitate water exchanges. The hole was covered with 0.5 mm Nytex® screen. The overlying water volume to sediment surface area ratio was approximately 7:1. Vessels were maintained in a water bath during the test. Depth of the water in the bath was set to be approximately 1 cm below the drain hole in the test vessel to eliminate flow of water from the bath into the test vessel. The water bath was maintained in a limited access, temperature controlled room. Temperatures in the room and water bath were independently set at a temperature of 23°C. Temperature was recorded using a temperature logger placed in a surrogate vessel; temperatures were recorded at an hourly frequency. The photoperiod in the test chamber was set at 16:8 hour light:dark. Lighting was supplied by cool white fluorescent bulbs.

The day before test initiation, control and test sediments were sifted using a 2 mm sieve to remove rocks, twigs, and other debris. Organisms indigenous to the sediments, if noted, were removed from the sediments; no organisms were noted during the preparation of sediments for this toxicity test. Sediments were placed in the test vessels with overlying water overnight, and any floating detritus was removed the next morning. Organisms were added below the water surface at test initiation. Organisms that failed to sink or appeared unhealthy were removed and replaced.

Overlying water for the amphipod assay was a 50/50 mixture of natural surface water and synthetic, moderately hard reconstituted water, prepared at ESI according to protocol (EPA 2000). Protocol specifies that overlying water used in invertebrate sediment toxicity tests may be culture water, well water, surface water, site water or reconstituted water (EPA, ASTM). The mixture of natural and reconstituted waters was selected to mitigate the poor survival rates observed in tests conducted solely with reconstituted water. Natural surface water was obtained from Bow Lake, in Strafford, New Hampshire. This body of water is rural in nature and receives no industrial inputs. The general characteristics of the final solution of reconstituted and natural surface water reflect the qualities of the surface water source used in the formulation of the overlying water for the test. Overlying water in each replicate was renewed daily after collection of water quality data. Each test chamber experienced approximately two volume additions daily. Water exchanges were facilitated by use of a distribution system designed to provide equal, regulated, flow to each chamber. The system was activated manually by the addition of water during the test.

Prior to the daily renewal, temperature, specific conductance, pH, and dissolved oxygen, were measured in one replicate of each treatment. Temperature was also monitored hourly throughout testing using a temperature logger housed in a surrogate test vessel. Dead organisms, when noted, were recorded and removed from the test chamber and floating organisms were countersunk. Observations were not recorded; however, no unusual organism behaviors were noticed during testing. Alkalinity, ammonia, and hardness of the overlying water were measured on Days 0 and 10. Each replicate was fed 1.5 mL of yeast/trout chow/Cerophyll or alfalfa leaves (YTC) mixture after the daily renewal.

After 10 days exposure, the organisms were recovered from the sediments. Each test chamber was gently swirled to loosen the sediments and the test material was dumped into an 8" stainless steel sieve with a 0.35 mm mesh screen. The sediments were washed through the sieve using reconstituted moderately hard water and material left on the screen was sorted to recover all living and dead test organisms. This process was continued until the entire sample was evaluated. Surviving amphipods were placed on tared weighing pans and dried overnight at 70°C to obtain dry weight to the nearest 0.01 mg. The mean dry weight of surviving organisms was determined to assess growth.

## 2.5 Statistical Analysis

Survival and growth data were analyzed using TOXSTAT® software to determine significant differences between the test sediments and the laboratory control. Statistical comparisons for each sample site were made against the laboratory control. Survival and growth data were evaluated to determine homogeneity of sample variances and normality of distribution using Shapiro-Wilk's Test for Normality and the F-Test for Equality of Two Variances, respectively. Data sets were subsequently evaluated using the appropriate parametric or non-parametric Analysis of Variance (ANOVA) statistic. Pair-wise comparisons were based on the 2 sample t-Test. Statistical difference was evaluated at  $\alpha=0.05$ . In cases where survival and growth was greater than that exhibited by the control no statistical analysis was conducted.

## 2.6 Quality Control

As part of the laboratory quality control program, reference toxicant evaluations are conducted on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. Results of these tests are presented in Table 5.

## 2.7 Protocol Deviations

Review of the data and procedures associated with these tests documented no deviations from established protocols.

# 3.0 RESULTS AND DISCUSSION

Sample collection and receipt data are summarized in Table 1. Survival and growth data from the *H. azteca* toxicity tests are summarized in Tables 2 and 3, respectively. Water quality data collected during the tests are summarized in Table 4. Reference toxicant data for the organisms is summarized in Table 5. Support data, including copies of laboratory bench sheets, are provided in Appendix A.

## 3.1 *Hyaella azteca* 10 Day Survival and Growth Toxicity Tests

At the end of the 10 day exposure period, mean survival was 87.5% in the laboratory control sediment. Survival in the individual laboratory control replicates ranged from 80% to 100%. Amphipods recovered from the laboratory control sediment had a mean dry weight of 0.083 mg/amphipod. The mean dry weight of a representative group of amphipods at the start of the test was 0.041 mg/amphipod. The minimum acceptable criteria for survival in the laboratory control is 80%, and organisms must show signs of growth. These data indicate that the organisms were healthy and not stressed by handling.

Review of temperature logger data, collected on an hourly basis, showed a temperature range of 20.5 to 25.5°C with a mean value of 23.2°C. Review of overlying water quality parameters showed that variation in conductance and hardness between the start and end of the tests was less than 50%. Alkalinity and ammonia values varied by greater than 50% between the start and end of testing. Water quality data collected during the tests are presented in Table 4.

Tables 2 and 3 provide a summary of survival and growth data for the project sites.

### 3.2 Summary

Results of the 10 day *H. azteca* sediment evaluations document that the test sediments collected from the Merrimack Village site did not have an impact on amphipod survival or growth when evaluated against laboratory control sediment.

## 4.0 REFERENCES

- APHA. 1998. *Standard Methods for the Examination of Water and Wastewater*, 20<sup>th</sup> Edition. Washington D.C.
- ASTM. 2001. Annual Book of ASTM Standards. Volume 11.05. *Test Methods for Measuring the Toxicity of sediment-Associated Contaminants with Freshwater Invertebrates*. E 1706-00. ASTM, Philadelphia.
- U.S. EPA. 2000. *Methods for Measuring the Toxicity and Bioaccumulation of Sediment-associated Contaminants with Freshwater Invertebrates*. Second Edition. EPA/600-R-99/064.

**TABLE 1. Summary of Sample Collection Information.  
Merrimack Village Sediment Evaluation.  
Gomez & Sullivan Engineers. September 2004.**

Field ID Number	ESI ID	Sample Collection		Sample Receipt	
		Date	Time	Date	Time
MUD-03T	001	09/17/04	1123	09/17/04	1435
MUD-05T	002	09/17/04	1145	09/17/04	1435

**TABLE 2. Summary of Survival Data: *H. azteca* Acute Exposure Sediment Toxicity Tests.  
Merrimack Village Sediment Evaluation. Gomez & Sullivan Engineers.  
September 2004.**

Sample ID	ESI ID	Mean Survival	Normal Distribution	Homogeneous Variance	t Value	Critical t Value	p Value	Statistically Significant Difference in Survival vs Lab Control <sup>1</sup>
Lab Control	Lab	87.5%	-	-	-	-	-	-
MUD-03T	-001	86.3%	Yes	Yes	0.0823	1.7613	0.4678	No
MUD-05T	-002	93.8%	-	-	-	-	-	-

**TABLE 3. Summary of Growth Data: *H. azteca* Acute Exposure Sediment Toxicity Tests.  
Merrimack Village Sediment Evaluation. Gomez & Sullivan Engineers.  
September 2004.**

Sample ID	ESI ID	Mean Growth as DW <sup>2</sup> (mg)	Normal Distribution	Homogeneous Variance	t Value	Critical t Value	p Value	Statistically Significant Difference in Growth vs Lab Control <sup>1</sup>
Lab Control	Lab	0.083	-	-	-	-	-	-
MUD-03T	-001	0.108	-	-	-	-	-	-
MUD-05T	-002	0.089	-	-	-	-	-	-

**COMMENTS:**

<sup>1</sup> - Statistical significance evaluated at  $\alpha = 0.05$ ; in cases where the evaluated endpoint was equal to or greater than that experienced in the laboratory control, no statistical analysis was conducted.

<sup>2</sup> - Dry Weight

**TABLE 4. Summary of Overlying Water Quality Data.  
*H. azteca* Acute Exposure Sediment Toxicity Tests.  
Merrimack Village Sediment Evaluation. Gomez & Sullivan Engineers.  
September 2004.**

Sample ID	ESI ID	pH (SU)	Conductance (µmhos/cm)	Alkalinity (mg/L)	Ammonia (mg/L)	Hardness (mg/L)
Day 0 - 09/21/04						
Lab Control	Lab	6.90	157	<10	0.3	38
MUD-03T	-001	7.11	180	<10	0.1	44
MUD-05T	-002	7.09	177	<10	0.6	45
Day 10 - 10/01/04						
Lab Control	Lab	7.28	204	30	<0.1	53
MUD-03T	-001	7.29	208	33	<0.1	57
MUD-05T	-002	7.37	211	43	<0.1	57

**TABLE 5. Reference Toxicant Evaluation. Merrimack Village Sediment Evaluation.  
Gomez & Sullivan Engineers. September 2004.**

REFERENCE TOXICANT EVALUATION (Results are expressed as ppm Cadmium)						
Species	Start Date	LC-50	Historic Mean	Number of Tests	±1 Std Deviation	±2 Std Deviation
<i>H. azteca</i>	09/01/04	0.0010	0.015	38	0.031	0.062

## APPENDIX A RAW DATA STATISTICAL SUPPORT

Contents	Number of Pages
<i>H. azteca</i> 10-day Toxicity Tests	
<i>H. azteca</i> Daily Observation Bench Sheets	1
<i>H. azteca</i> Recovery Bench Sheets	2
<i>H. azteca</i> Survival Data Summary	1
<i>H. azteca</i> Survival Data Statistical Analysis	3
<i>H. azteca</i> Growth Bench Sheets	1
<i>H. azteca</i> Growth Data Summary	1
<i>H. azteca</i> Organism History Data	1
<i>H. azteca</i> Initial Dry Weights	1
Data Logger Temperature Profile	1
Sample Receipt Log	1
Chain Of Custody	1
 Total Number Appendix Pages	 14

## H. azteca 10 DAY EXPOSURE SEDIMENT ASSAY

STUDY # 12564				CLIENT: Gomez & Sullivan				OVERLYING WATER: MHR/POND				START DATE: 9/21/04			
DAY	Lab Control				-001				-002						
	DO (mg/L)	S/C (umhos/cm)	pH (SU)	TEMP (°C)	DO (mg/L)	S/C (umhos/cm)	pH (SU)	TEMP (°C)	DO (mg/L)	S/C (umhos/cm)	pH (SU)	TEMP (°C)			
0	8.4	157	6.90	22	8.2	180	7.11	23	8.1	177	7.09	23			
1	8.3	177	7.08	22	8.3	192	7.27	22	8.2	191	7.28	22			
2	7.9	182	6.63	22	7.9	200	7.05	22	7.8	198	7.04	22			
3	8.0	187	7.07	22	7.9	198	7.10	22	7.7	196	7.15	22			
4	8.4	206	6.88	22	8.4	214	7.19	22	8.4	211	7.16	22			
5	7.5	190	7.11	22	7.0	203	7.21	23	7.0	200	7.33	23			
6	7.8	185	6.90	23	7.7	196	7.04	23	7.4	194	7.09	23			
7	6.6	186	7.10	23	6.3	193	7.15	23	6.2	192	7.20	23			
8	7.1	189	7.00	24	7.1	192	7.07	24	6.6	191	7.13	24			
9	7.5	198	7.06	23	7.3	203	7.14	23	6.9	203	7.25	23			
10	7.3	204	7.28	24	7.1	208	7.29	24	6.8	211	7.37	24			

DAY									Water Quality Station #	S/C Meter #	ΔH <sub>2</sub> O fed	DATE	INIT
	DO (mg/L)	S/C (umhos/cm)	pH (SU)	TEMP (°C)	DO (mg/L)	S/C (umhos/cm)	pH (SU)	TEMP (°C)					
0									1	330i	✓	9/21/04	DAB
1									2	330i	✓	9/22/04	DAB
2									2	330i	✓	9/23/04	DAB
3									2	330i	✓	9/24/04	DAB
4									2	330i	✓	9/25/04	BB
5									1	330i	✓	9/26/04	DAB
6									2	330i	✓	9/27/04	✓
7									1	330i	✓	9/28/04	✓
8									2	330i	✓	9/29/04	BB
9									2	330i	✓	9/30/04	BB
10									2	330i	✓	10/1/04	DAB

### Date & Initial Chemistry Sampling

DAY 0	DAY 0	DAY 10
Alkalinity, Hardness & Ammonia in MHR/POND	Alkalinity, Hardness & Ammonia in each treatment	Alkalinity, Hardness & Ammonia in each treatment
✓	✓	✓

FEED 1 mL of YCT food mixture/replicate

Two Volume additions Daily

23 °C

ESI STUDY# 12564 Gomez and Sullivan  
H. azteca SEDIMENT ASSAY

DAY 10:

SAMPLE ID	TIME		COMMENTS
		#LIVE	
Lab A	0945	8	
Lab B	0950	8	
Lab C	0952	10	
Lab D	0954	10	
Lab E	1000	9	
Lab F	1005	8	
Lab G	1010	8	
Lab H	1015	9	
-002A	1040	10	
-002B	1045	9	
-002C	1047	10	
-002D	1053	9	
-002E	1056	9	
-002F	1058	10	
-002G	1105	8	
-002H	1107	10	

ANALYST: BB  
DATE: 10/1/04

**ESI STUDY# 12564 Gomez and Sullivan**  
**H. azteca SEDIMENT ASSAY**

**DAY 10:**

SAMPLE ID	TIME		COMMENTS
		#LIVE	
001A	1040	10	
001B	1050	9	
001C	1105	7	
001D	1115	6	
001E	1125	9	
001F	1135	9	
001G	1150	9	
001H	1155	10	

ANALYST: DAB

DATE: 10/1/04

**STUDY: 12564**  
**CLIENT: Gomez & Sullivan**  
**PROJECT: Merrimack Village**  
**TASK: Hyalella azteca 10 Day Exposure Assay**  
**DATA: Day 10 Survival Data Summary**  
**START DATE: 09/21/04**  
**DATE ENDED: 10/01/04**

Project Site	ESI Ref #	Replicate	Larvae @ Start	Day 28 Surviving Organisms	Survival Rate	Mean Survival/ Site
Lab Control	Lab	A	10	8	80.0%	87.5%
		B	10	8	80.0%	
		C	10	10	100.0%	
		D	10	10	100.0%	
		E	10	9	90.0%	
		F	10	8	80.0%	
		G	10	8	80.0%	
		H	10	9	90.0%	
MUD-03T	1	A	10	10	100.0%	86.3%
		B	10	9	90.0%	
		C	10	7	70.0%	
		D	10	6	60.0%	
		E	10	9	90.0%	
		F	10	9	90.0%	
		G	10	9	90.0%	
		H	10	10	100.0%	
MUD-05T	2	A	10	10	100.0%	93.8%
		B	10	9	90.0%	
		C	10	10	100.0%	
		D	10	9	90.0%	
		E	10	9	90.0%	
		F	10	10	100.0%	
		G	10	8	80.0%	
		H	10	10	100.0%	

Title: Gomez & Sullivan H azteca Survival  
File: 12564 Transform: ARC SINE(SQUARE ROOT(Y))

Shapiro - Wilk's Test for Normality

D = 0.3669  
W = 0.9085

Critical W = 0.8440 (alpha = 0.01 , N = 16)  
W = 0.8870 (alpha = 0.05 , N = 16)

Data PASS normality test (alpha = 0.01). Continue analysis.

Title: Gomez & Sullivan H azteca Survival  
File: 12564 Transform: ARC SINE(SQUARE ROOT(Y))

F-Test for Equality of Two Variances

GROUP	IDENTIFICATION	VARIANCE	F
1	Lab	0.0181	
2	MUD-03T	0.0344	1.9033

(p-value = 0.4151)

Critical F = 8.8854 (P=0.01, 7, 7)  
4.9949 (P=0.05, 7, 7)

Since F <= Critical F, FAIL TO REJECT Ho: Equal Variances (alpha = 0.01).

Title: Gomez & Sullivan H azteca Survival  
 File: 12564 Transform: ARC SINE(SQUARE ROOT(Y))

Summary Statistics on Transformed Data TABLE 1 of 2

GRP	IDENTIFICATION	N	MIN	MAX	MEAN
1	Lab	8	1.1071	1.4120	1.2188
2	MUD-03T	8	0.8861	1.4120	1.2122

Title: Gomez & Sullivan H azteca Survival  
 File: 12564 Transform: ARC SINE(SQUARE ROOT(Y))

Summary Statistics on Transformed Data TABLE 2 of 2

GRP	IDENTIFICATION	VARIANCE	SD	SEM	C.V. %
1	Lab	0.0181	0.1344	0.0475	11.0233
2	MUD-03T	0.0344	0.1854	0.0655	15.2913

Title: Gomez & Sullivan H azteca Survival  
 File: 12564 Transform: ARC SINE(SQUARE ROOT(Y))

ANOVA Table

SOURCE	DF	SS	MS	F
Between	1	0.0002	0.0002	0.0068
Within (Error)	14	0.3669	0.0262	
Total	15	0.3670		

(p-value = 0.9356)

Critical F = 8.8616 (alpha = 0.01, df = 1,14)  
 = 4.6001 (alpha = 0.05, df = 1,14)

Since  $F < \text{Critical } F$  FAIL TO REJECT  $H_0$ : All equal (alpha = 0.05)

Title: Gomez & Sullivan H azteca Survival  
 File: 12564 Transform: ARC SINE(SQUARE ROOT(Y))

2 Sample t-Test - TABLE 1 OF 2 Ho: Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	TRANS t STAT	SIG 0.05

1	Lab	1.2188	0.8750	
2	MUD-03T	1.2122	0.8625	0.0823

Equal Var: t critical value = 1.7613 (1 Tailed, alpha = 0.05, df = 14)  
(p-value = 0.4678)

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	TRANS T STAT	SIG 0.05
1	Lab	1.2188	0.8750		
2	MUD-03T	1.2122	0.8625	0.0823	

Unequal Var: t critical value = 1.7709 (1 Tailed, alpha = 0.05, df = 13)  
(p-value = 0.4678)

Title: Gomez & Sullivan H azteca Survival

File: 12564 Transform: ARC SINE(SQUARE ROOT(Y))

2 Sample t-Test - TABLE 2 OF 2 Ho: Control<Treatment

Equal Variances:

GROUP	IDENTIFICATION	NUM OF REPS	MIN SIG DIFF (IN ORIG. UNITS)	% OF CONTROL	DIFFERENCE FROM CONTROL
1	Lab	8			
2	MUD-03T	8	0.1064	12.1	0.0125

Unequal Variances:

GROUP	IDENTIFICATION	NUM OF REPS	MIN SIG DIFF (IN ORIG. UNITS)	% OF CONTROL	DIFFERENCE FROM CONTROL
1	Lab	8			
2	MUD-03T	8	0.1071	12.1	0.0125

# LARVAL FISH DRY WEIGHTS

Page 1 of 2

CLIENT: <u>Gomez Ha</u>		TEST END DATE: <u>10/1/04</u>	
STUDY #: <u>12564</u>		SPECIES: <u>Huatzuca</u>	
CONC	REP	TARE WT (g)	FISH + FOIL (g)
Lab	A	<u>0.20856</u>	<u>0.20901</u>
	B	<u>0.21444</u>	<u>0.21521</u>
	C	<u>0.20723</u>	<u>0.20782</u>
	D	<u>0.20713</u>	<u>0.20807</u>
	AE	<u>0.21222</u>	<u>0.21301</u>
	BF	<u>0.21370</u>	<u>0.21455</u>
	CG	<u>0.20629</u>	<u>0.20695</u>
	DH	<u>0.20556</u>	<u>0.20632</u>
-001	A	<u>0.21019</u>	<u>0.21124</u>
	B	<u>0.20925</u>	<u>0.21010</u>
	C	<u>0.21048</u>	<u>0.21114</u>
	D	<u>0.20755</u>	<u>0.20839</u>
	AE	<u>0.20914</u>	<u>0.21004</u>
	BF	<u>0.21037</u>	<u>0.21148</u>
	CG	<u>0.20868</u>	<u>0.20975</u>
	DH	<u>0.21174</u>	<u>0.21266</u>
-002	A	<u>0.20855</u>	<u>0.20948</u>
	B	<u>0.20738</u>	<u>0.20831</u>
	C	<u>0.20949</u>	<u>0.21019</u>
	D	<u>0.20813</u>	<u>0.20880</u>
	AE	<u>0.20525</u>	<u>0.20625</u>
	BF	<u>0.20921</u>	<u>0.21017</u>
	CG	<u>0.21044</u>	<u>0.21101</u>
	DH	<u>0.20848</u>	<u>0.20944</u>
b	A		
	B		
	C		
	D		
	A		
	B		
	C		
	D		
DATE: <u>10/1/04</u>		<u>10/4/04</u>	
TIME: <u>1055</u>		<u>1450</u>	
INIT: <u>✓</u>		<u>✓</u>	

**STUDY: 12564**

**CLIENT: Gomez & Sullivan**

**PROJECT: Merrimack Village**

**TASK: Hyalella azteca 10 Day Exposure Assay**

**DATA: Day 10 Growth Summary**

**START DATE: 09/21/04**

**DATE ENDED: 10/01/04**

**INITIAL DRY WT.: 0.041 mg/individual**

Project Site	ESI Ref #	Replicate	Dry Weight (mg/individual)	Mean Dry Weight for Site
Lab Control	Lab	A	0.056	0.083
		B	0.096	
		C	0.059	
		D	0.094	
		E	0.088	
		F	0.106	
		G	0.082	
		H	0.084	
MUD-03T	-1	A	0.105	0.108
		B	0.094	
		C	0.094	
		D	0.140	
		E	0.100	
		F	0.123	
		G	0.119	
		H	0.092	
MUD-05T	-2	A	0.093	0.089
		B	0.103	
		C	0.070	
		D	0.074	
		E	0.111	
		F	0.096	
		G	0.071	
		H	0.096	



# Aquatic Research Organisms

## DATA SHEET

### I. Organism History

Species: Hyalella azteca  
Source: Lab reared X Hatchery reared \_\_\_\_\_ Field collected \_\_\_\_\_  
Hatch date 9/14/04 Receipt date \_\_\_\_\_  
Lot number 091404HA Strain ARO  
Brood Origination USFWS MO

### II. Water Quality

Temperature 23 °C Salinity — ppt DO Sat  
pH 7.0 Hardness ~120 ppm

### III. Culture Conditions

System: FW static renewal  
Diet: Flake Food ✓ Phytoplankton \_\_\_\_\_ Trout Chow ✓  
Brine Shrimp \_\_\_\_\_ Rotifers \_\_\_\_\_ Other \_\_\_\_\_  
Prophylactic Treatments: \_\_\_\_\_  
Comments: \_\_\_\_\_

### IV. Shipping Information

Client: ESI # of Organisms: 350+  
Carrier: PICK UP Date Shipped: 9/24/04

Biologist: Steve Lunte

1 - 800 - 927 - 1650

PO Box 1271 • One Lafayette Road • Hampton, NH 03842 • (603) 926-1650

# *Hyalella azteca* Assay

STUDY NUMBER: \_\_\_\_\_

CLIENT: \_\_\_\_\_

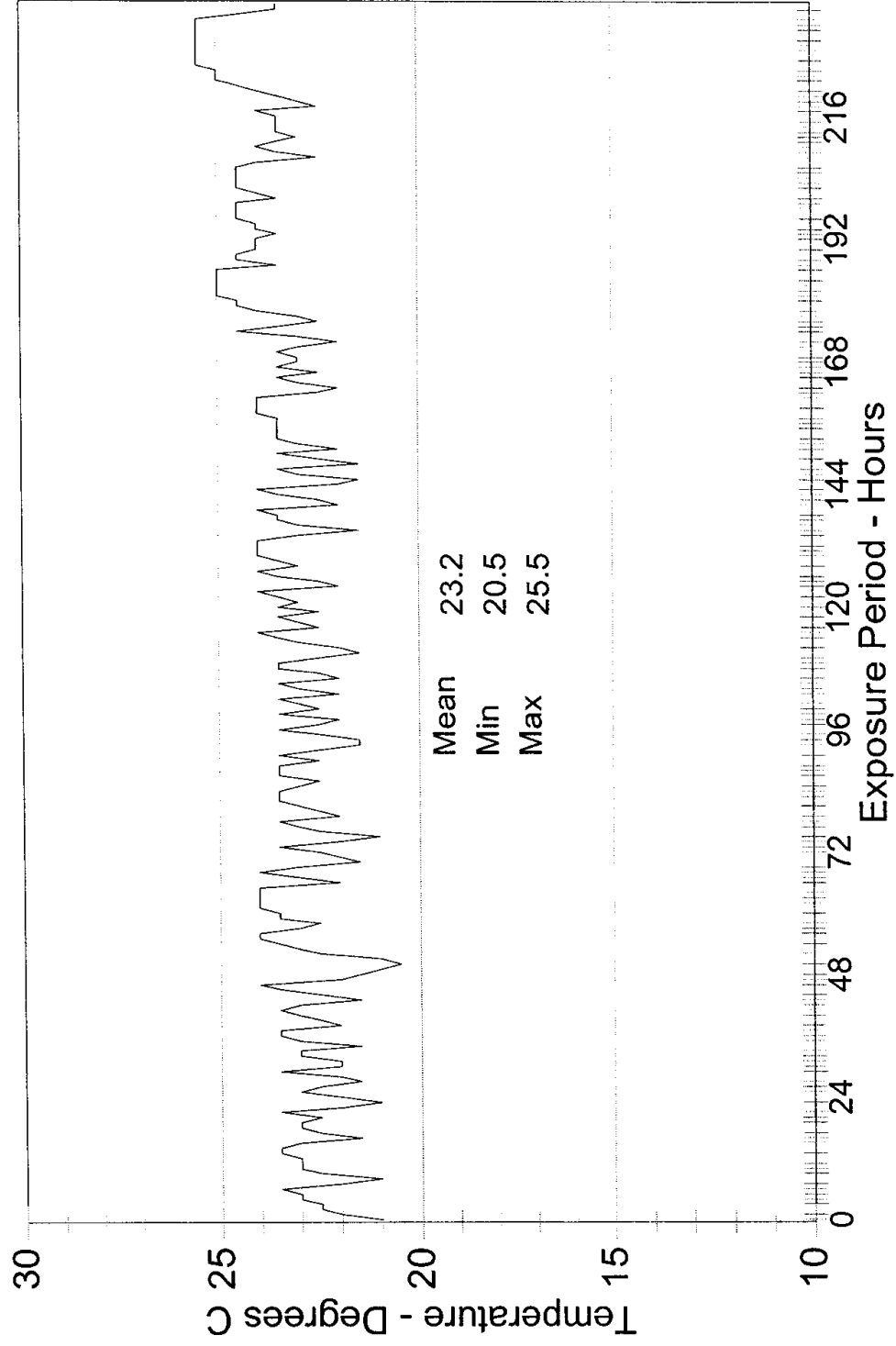
ESI SAMPLE ID	REP	TARE WEIGHT (G)	<i>H. azteca</i> + FOIL (G)	NET WEIGHT (MG)	# <i>H. azteca</i>	MEAN DRY WEIGHT PER <i>H. azteca</i> (MG)
START ORGANISMS	A	0.20964	0.20807	.430	10	0.043
	B	0.20958	0.21002	.440	10	0.044
	C	0.20914	0.20950	.360	10	0.036
	D	0.21045	0.21084	.390	10	0.039
RECORDED BY:						
DATE:		9/21/04				

0.041

NOTES: \_\_\_\_\_

# Hyaella Azteca 10 Day Survival Assay

Temperature Profile



# LABORATORY SAMPLE RECEIVING LOG

ESI Project Number: 12564 Date/Time Received: 9/17/04

Client Name and Address: Gomez + Sullivan  
55 North Stark Highway Weare, NH 03281

Method of Shipment/ Pick Up: From: client  
 Via: client

Description of Shipping / Packing Containers(s) 2 coolers  
 (Number, Type, Size)

Sample ID	ESI #	# Containers/Vol/Wt	Other	Sampled
MUD-03T	-001	2x1g		9/17/04 1123
MUD-05T	-002	L		9/17/04 1145

Sample Storage Location and Required Storage Conditions Refrigerator "F" Locked, 4°C & Dark

Signature: [Signature] Date: 9/17/04

Notes: Rec'd on ice

Date and Description of Final Sample Removal / Disposal: \_\_\_\_\_

# CHAIN OF CUSTODY RECORD SAMPLES TO RIAL

<b>ENVIROSYSTEMS, INCORPORATED</b>		Customer Services: Phone # (603) 926-3345 Fax # (603) 926-3521		ESI# <u>12564</u>	
One Lafayette Road, P.O. Box 778, Hampton, New Hampshire 03842		PROJECT NAME: <u>108 made Village</u>		PAGE 1 OF 1	
CLIENT: <b>ESI</b>	CONTACT: <u>Linnea Hawthaway</u>	P.O.#			
REPORT TO: <b>ESI</b>	ADDRESS:	PHONE: <u>529-4600</u>			
INVOICE TO: <b>ESI</b>	ADDRESS: <u>Cornet and Sullivan Engineers, SE N Stark Hwy, Weare, NH 03281</u>	SAMPLED BY: <u>Lason George</u>			

SAMPLE #	FIELD IDENTIFICATION (MUST AGREE WITH CONTAINER)	DATE SAMPLED	COMPOSITE (YES/NO)	TIME SAMPLED	SAMPLE MATRIX	CONTAINER #VOLUME	DID YOU FIELD PRESERVE	NOTES / ANALYSIS REQUESTED (SPECIAL INSTRUCTIONS, CAUTIONS, ETC.)
-001	MUD-03T	9/17/04 11:23	Yes		Sediment	2-gal	N	
-002	MUD-05T	9/17/04 11:45	Yes		Sediment	2-gal	N	

RELINQUISHED BY: <u>[Signature]</u>	DATE: <u>9/17/04</u>	TIME: <u>14:35</u>	RECEIVED BY: <u>[Signature]</u>	DATE: <u>9/17/04</u>	TIME: <u>14:35</u>
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:
RELINQUISHED BY:	DATE:	TIME:	RECEIVED BY:	DATE:	TIME:

COMMENTS: \_\_\_\_\_

A CHAIN OF CUSTODY IS REQUIRED WITH EACH SET OF SAMPLES